

Engineering and Operations Workgroup Study Plans

Study #1: Model Development Study Plan

November 16, 2001

Goal

The objective of this study is to develop and validate the necessary models, including collection of supporting data to simulate the physical attributes of Oroville Facilities operations to support studies involving changes to or impacts on flow, water levels, water supply, water temperature, and power generation

Proposed Goal

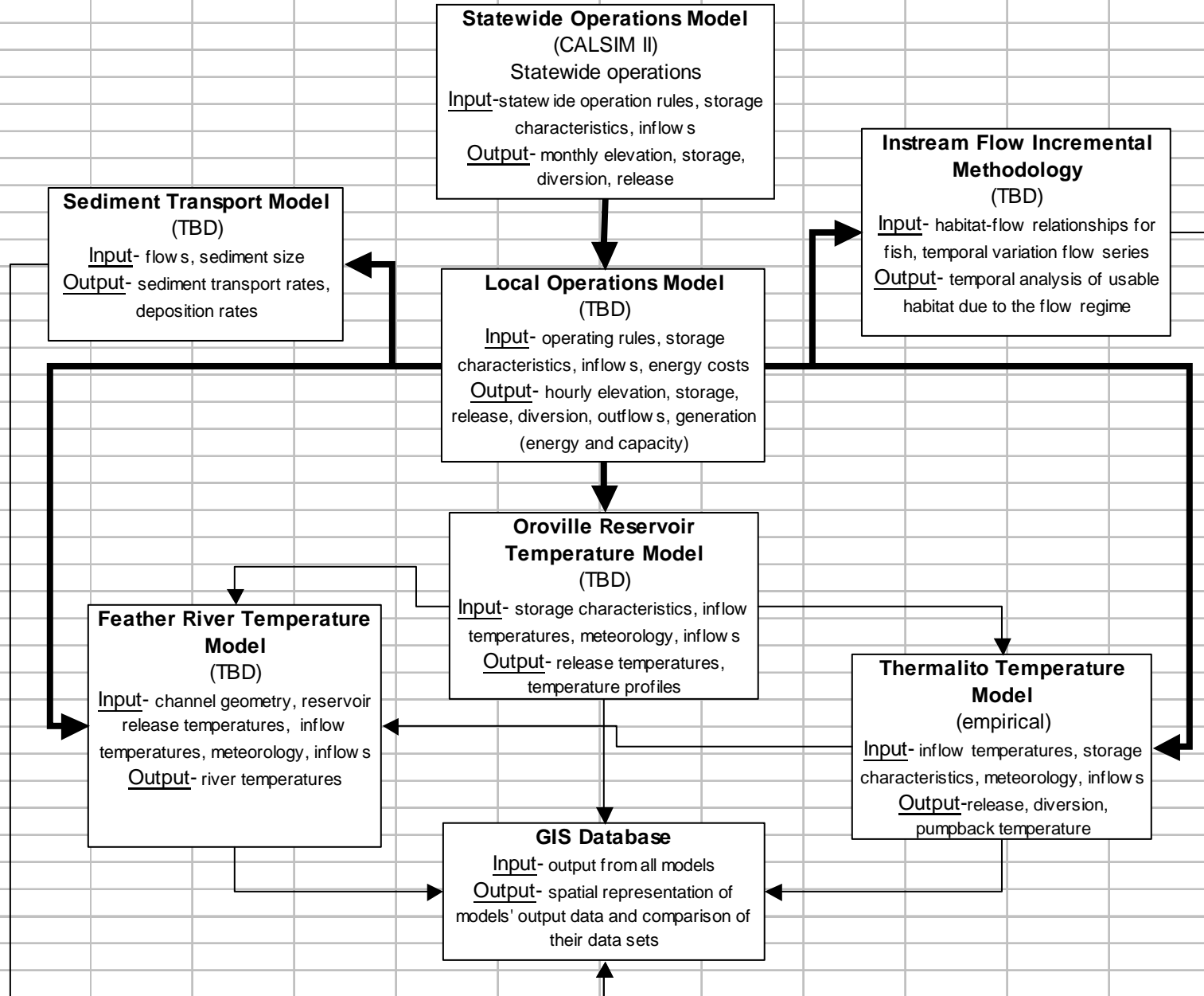
Develop and validate a comprehensive modeling system to allow simulation of Oroville – Thermalito complex and Lower Feather River physical parameters to support impact analysis studies.

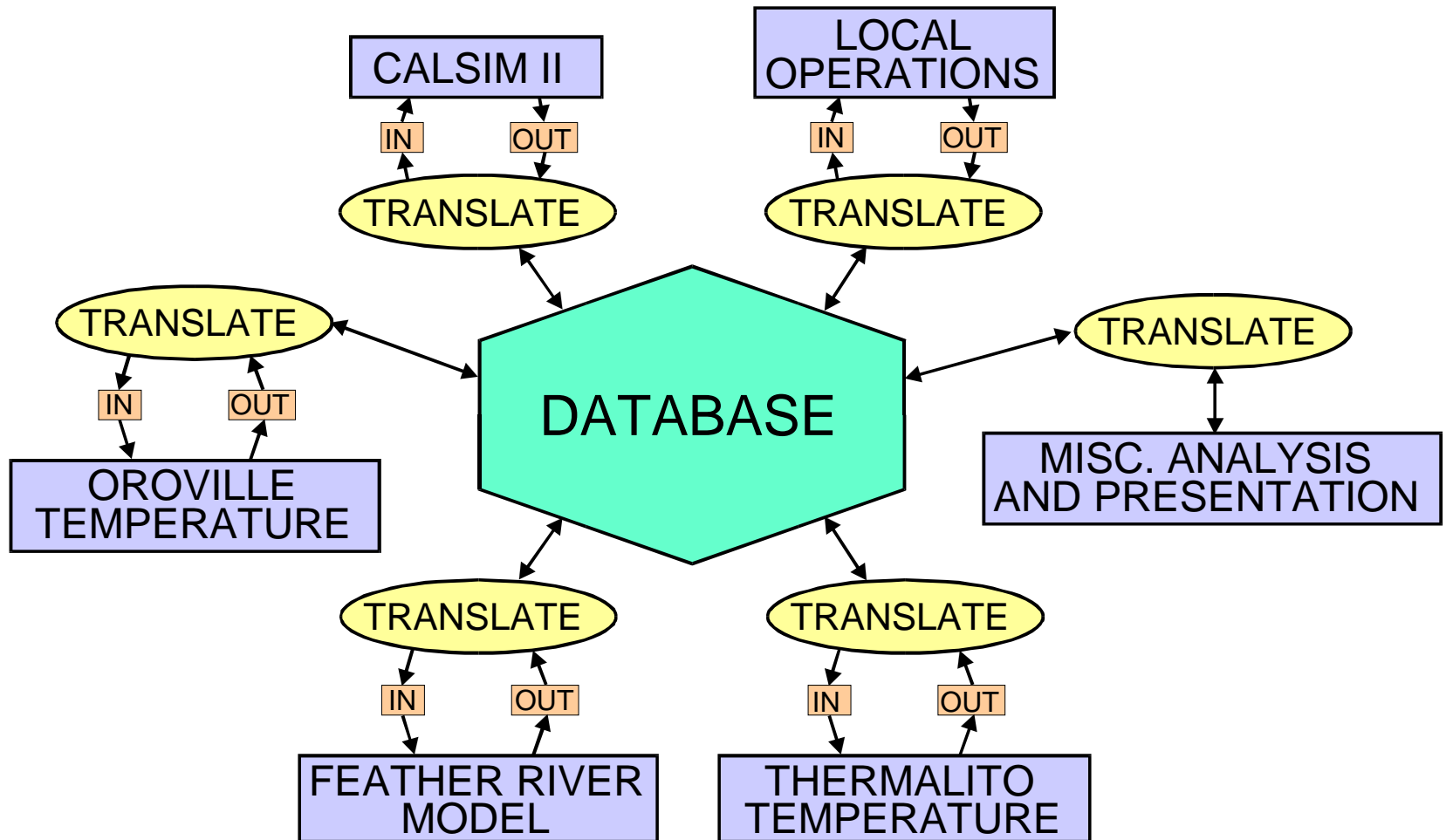
System includes all required models, utilities, databases, and procedures to perform all required simulations

Task 1. Define Modeling Scheme

- Subtasks
 - Major Assumptions
 - Modeling process
 - Benchmark simulation assumptions
 - How will data be managed in the process
 - Specific Modeling Tools
 - Data Translation Definition
 - Modeling Procedure
 - Data Management Tools

Modeling Studies Flow Chart





Task 2. Define Individual Model Development Plans

- Potential Model Types Required
 - Statewide Operations
 - Local Operations
 - Oroville Reservoir Temperature
 - Thermalito Complex Temperature
 - Feather River Temperature
 - Feather River Flow-Stage

Task 2. Define Individual Model Development Plans

- Major tasks in each plan
 1. Define outputs required
 2. Review existing models
 3. Review existing data
 4. Review modeling tools
 5. Select appropriate model
 6. Collect field data for model development, calibration, verification
 7. Develop/calibrate/verify model
 8. Integrate in overall modeling scheme
 9. Perform benchmark simulations

Task 3. Develop Individual Models

- Complete development of selected models defined in the individual model development plans

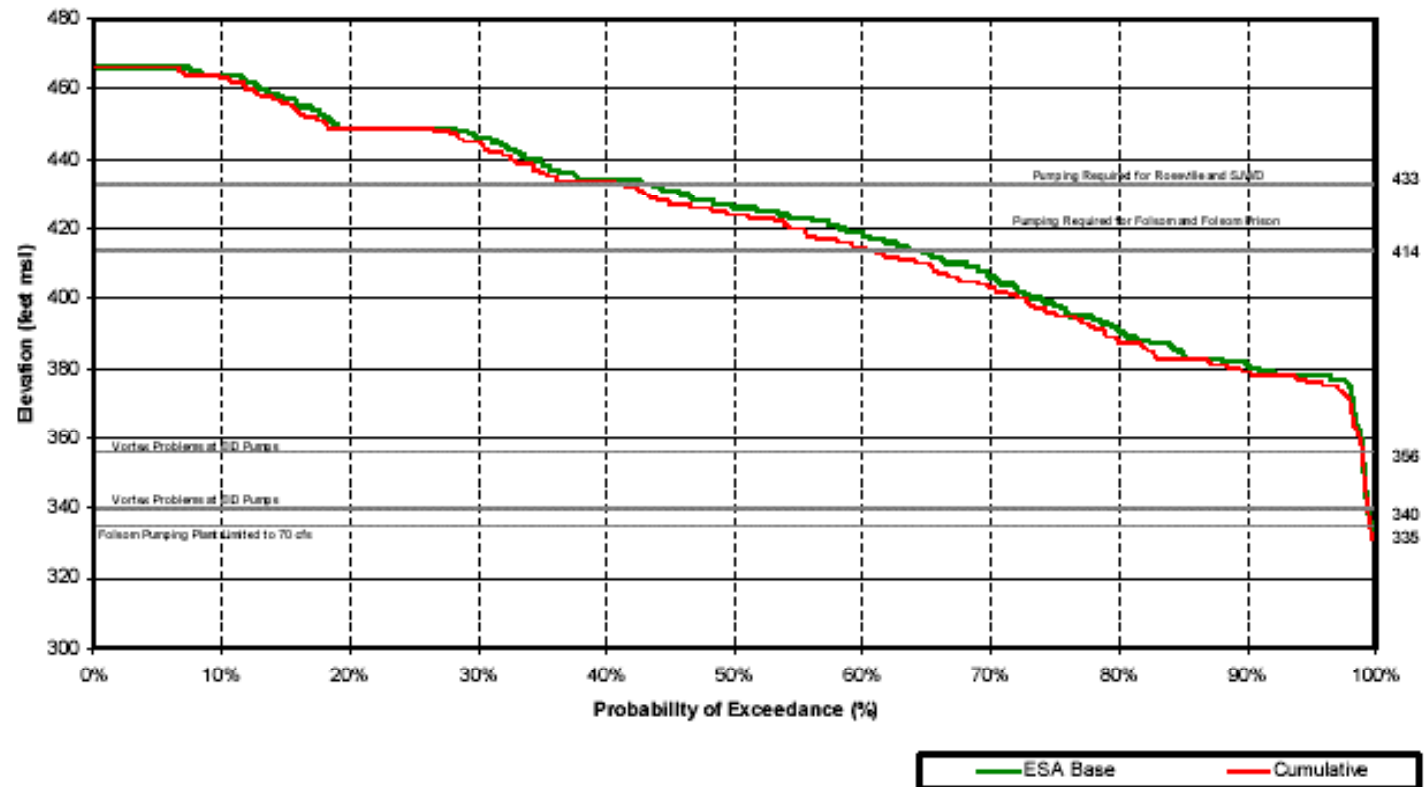
Task 4. Fully Implement Modeling Scheme

- Finalize modeling procedures
- Develop and document model interactions
- Develop and document “translators”
- Database management

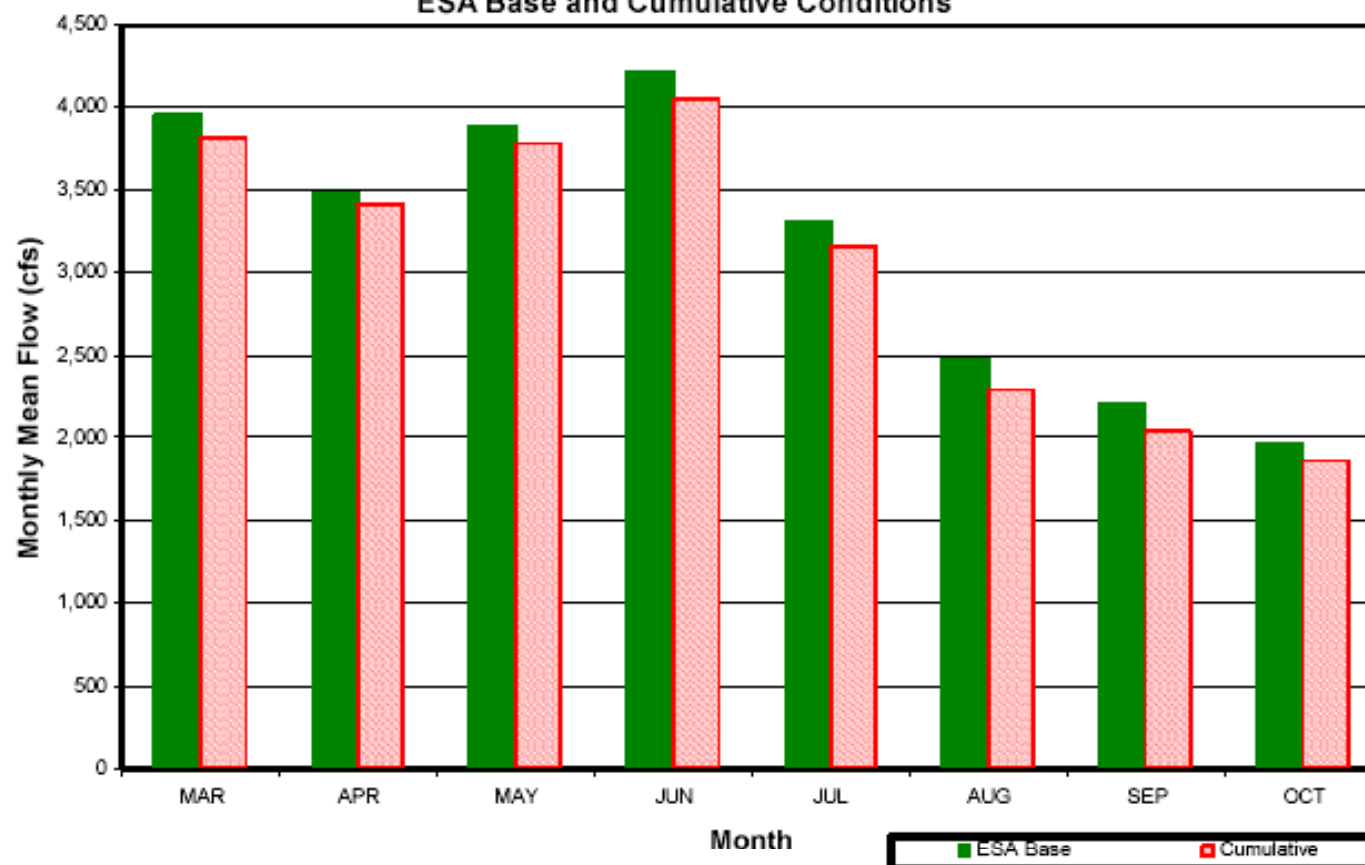
Task 5. Standardized Modeling Outputs

- Develop standardized set of outputs
- Ensure appropriate data from model in database
- Develop process to automatically create outputs
- Complete documentation of outputs
- Probably use an Excel spreadsheet to pull data from database, create tabular and graphical outputs, and output them in pdf format.

Folsom Reservoir End of Month Elevation Under ESA Base and Cumulative Conditions: April through October



Long-term Average Lower American River Release From Nimbus Dam Under
ESA Base and Cumulative Conditions



Flow Ranges Affecting Riparian Vegetation in the Lower American River Below Nimbus Dam Under ESA Base and Cumulative Conditions

Month	Number of Years' Within Specified Ranges								
	3,000-4,500 cfs			< 1,765 cfs			< 2,000 cfs		
	ESA Base	Cumulative	Difference	ESA Base	Cumulative	Difference	ESA Base	Cumulative	Difference
Mar	21	20	-1	12	15	3	14	16	2
Apr	17	17	0	11	12	1	11	12	1
May	29	29	0	11	12	1	11	12	1
Jun	27	28	1	7	7	0	8	9	1
Jul	11	10	-1	13	15	2	17	16	-1
Aug	25	23	-2	25	28	3	28	32	4
Sep	16	15	-1	29	34	5	32	38	6
Oct	3	2	-1	28	31	3	28	31	3

* Based on 70 years modeled.

Products

- Modeling Environment
- Models
- Standardized Output Products